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2. To: (Receiving Organization) K. R. Fecht, Manager Geosciences Group			3. From: (Originating Organization) R. L. Jackson RCRA Groundwater Monitoring Coordinator/Geosciences Group			4. Related EDT No: N/A				
5. Proj/Prog/Dept/Div: RCRA/EERGF/ED			6. Cog/Proj Engr: R. L. Jackson			7. Purchase Order No: N/A				
8. Originator Remarks: <div style="text-align: center; margin-top: 20px;">Approval/Release</div>						9. Equip/Component No: N/A				
						10. System/Bldg/Facility: N/A				
						12. Major Assm Dwg No: N/A				
						13. Permit/Permit Application No: N/A				
11. Receiver Remarks: <div style="text-align: center; margin-top: 20px;"> </div>						14. Required Response Date: N/A				
15. DATA TRANSMITTED							(F)	(G)	(H)	(I)
(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev No.	(E) Title or Description of Data Transmitted			Impact Level	Reason for Transmittal	Originator Disposition	Receiver Disposition
1	WHC-SD-EN-PMP-001		0	Project Management Plan- RCRA Groundwater Monitoring			4	1		
16. KEY										
Impact Level (F)		Reason for Transmittal (G)				Disposition (H) & (I)				
1, 2, 3, or 4 see MRP 5.43 and EP-1.7		1. Approval 4. Review 2. Release 5. Post-Review 3. Information 6. Dist (Receipt Acknow. Required)				1. Approved 4. Reviewed no/comment 2. Approved w/comment 5. Reviewed w/comment 3. Disapproved w/comment 6. Receipt acknowledged				
17. SIGNATURE/DISTRIBUTION										
(See Impact Level for required signatures)										
(G)	(H)	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M) MSIN	Reason
1	I	Cog./Proj. Eng	RL Jackson	5/3/91	H4-56					
1	I	Cog./Proj. Eng. Mgr.	KR Fecht	5/3/91	H4-56					
1	I	QA	DG Farwick	5/3/91	H4-16					
		Safety	N/A							
18.		19.		20.		21. DOE APPROVAL (if required)				
 RL Jackson Signature of EDT Originator		 KR Fecht Authorized Representative for Receiving Organization		 KR Fecht Cognizant/Project Engineer's Manager		Ltr No. <u>N/A</u> <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/comments <input type="checkbox"/> Disapproved w/comments				

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SUPPORTING DOCUMENT

1. Total Pages

34

2. Title

Project Management Plan - RCRA Groundwater Monitoring

3. Number

WHC-SD- EN-PMP-001

4. Rev. No.

0

5. Key Words

RCRA
Groundwater Monitoring

6. Author

R. L. Jackson

Name (Type or Print)

Signature
*Ronald L. Jackson*Geosciences Group/81231/E35AABEE421
Organization/Charge Code 67021

7. Abstract

This Project Management Plan (PMP) describes the management system used by the Geosciences Group of the Environmental Engineering and Geotechnology Function, to control Resource Conservation and Recovery Act (RCRA) groundwater monitoring on the Hanford Site. The activities controlled by this PMP include monitoring well network design and installation, monitoring well logging and testing, monitoring of groundwater quality and groundwater levels, analysis of monitoring well data, documenting these activities, and reporting of monitoring results for Hanford Site facilities falling under the authority of the RCRA.

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9. Impact Level

4

10. K. R. Fecht

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1.0 INTRODUCTION

This Project Management Plan (PMP) describes the management system used by the Geosciences Group of the Environmental Engineering and Geotechnology Function, to control groundwater environmental monitoring at Hanford Site facilities that are under the authority of the Resource Conservation and Recovery Act (RCRA). The activities controlled by this PMP include the following:

- RCRA facility hydrogeologic characterization and monitoring design
- RCRA support for well construction, logging, and testing
- Monitoring of groundwater quality and groundwater levels
- Ensuring that groundwater monitoring is conducted in a manner consistent with the requirements of permitting documents and monitoring plans
- Monitoring data analysis and evaluation
- Activity planning, documentation, and reporting
- Regulatory support.

This PMP describes the scope of the RCRA Groundwater Monitoring Program, defines the organizational structure and responsibilities of its participants, and describes the tracking and reporting procedures.

This PMP addresses those aspects of RCRA groundwater monitoring that are common to all facilities. Descriptions of facility-specific monitoring activities are presented in groundwater monitoring plans and sampling and analysis plans (SAP). Cost and schedule information for the RCRA Groundwater Monitoring Program are presented in cost account plans. Modifications to this PMP shall be made in accordance with WHC-CM-6-1 (WHC 1987a).

2.0 PROJECT DESCRIPTION

The RCRA Groundwater Monitoring Program supports the *Hanford Site Groundwater Protection Management Program* (DOE/RL 1989) by monitoring groundwater levels and quality at RCRA facilities on the Hanford Site. The applicable regulatory requirements, and the overall scope and strategy of the program are described in the program documentation. All work under this PMP will be performed in accordance with the requirements of the Westinghouse Hanford Company (Westinghouse Hanford) *Environmental Investigations and Site Characterization Manual* (WHC 1988a).

A process flow diagram for the RCRA Groundwater Monitoring Program is shown in Figure 2-1. This diagram summarizes the overall process of implementing the program. The RCRA Groundwater Monitoring Program has four primary components that are reflected both in the process flow diagram and in the organizational structure to be discussed in Section 3.0. These are: (1) the planning and coordination required at each RCRA facility to develop and implement a groundwater monitoring plan; (2) field support for installing the monitoring well network described in the groundwater monitoring plan; (3) well remediation and maintenance; and (4) implementing groundwater sample collection, data management, data analysis, and regulatory permitting.

The first of these components is shown in sheets 1 and 2 of Figure 2-1. Sheet 1 shows the regulatory and programmatic interfaces with other environmental planning activities and the development of groundwater monitoring plans for each RCRA facility. Information needs are derived from the RCRA permitting process and the hydrogeologic requirements identified in DOE/RL 1989 and sub-tier plans. The groundwater monitoring plan and its sub-tier documents provide the information required to install the monitoring well network and implement groundwater monitoring, data management, and data analysis.

The second, third, and fourth components are shown in sheets 2 and 3 of Figure 2-1. Well remediation and maintenance are shown in sheet 2, and the process of installing the monitoring well network is illustrated in the upper part of sheet 3. The Geosciences Group provides well location and general design information, geological, and hydrological support to the Environmental Projects Department during well construction. Upon completion and acceptance of the well, sample collection and analysis may begin as illustrated in the lower part of sheet 3. The data are documented and reported to the regulators on a quarterly and annual basis. After the well is installed, the Geosciences Group monitors well performance and identifies well remediation and maintenance requirements.

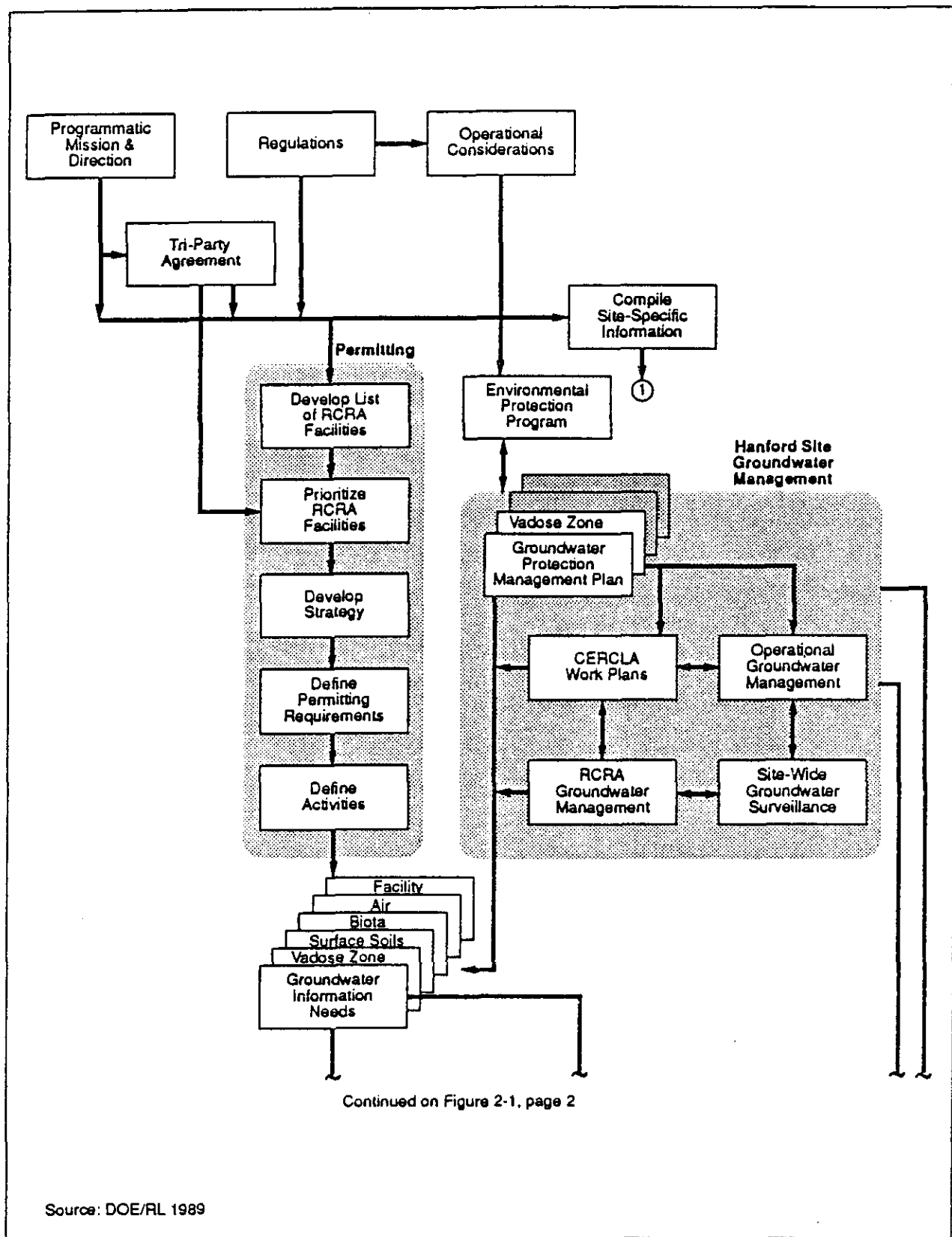


Figure 2-1. Hanford Site RCRA Groundwater Program Process Flow Sheet (page 1 of 3).

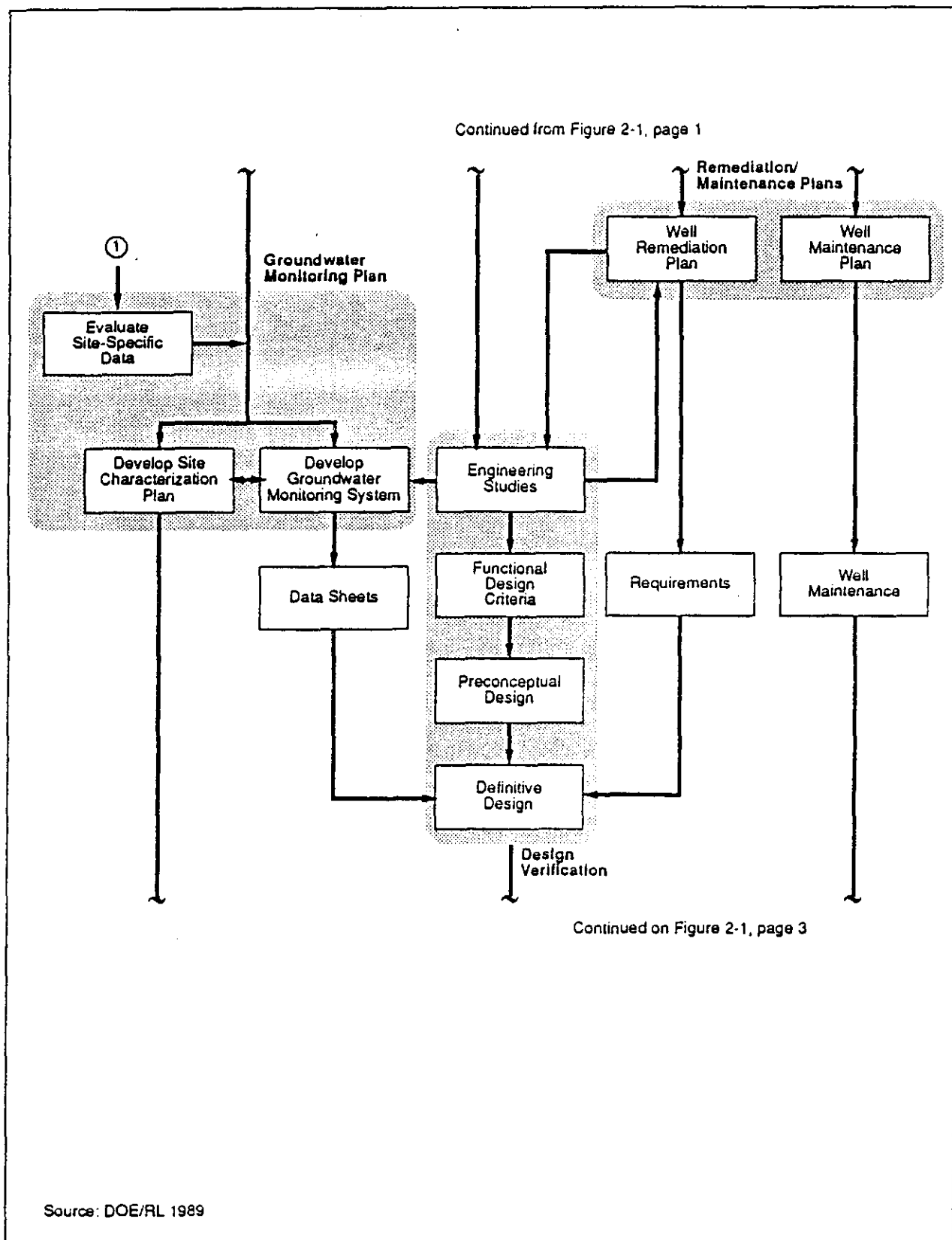


Figure 2-1. Hanford Site RCRA Groundwater Program
Process Flow Sheet (page 2 of 3).

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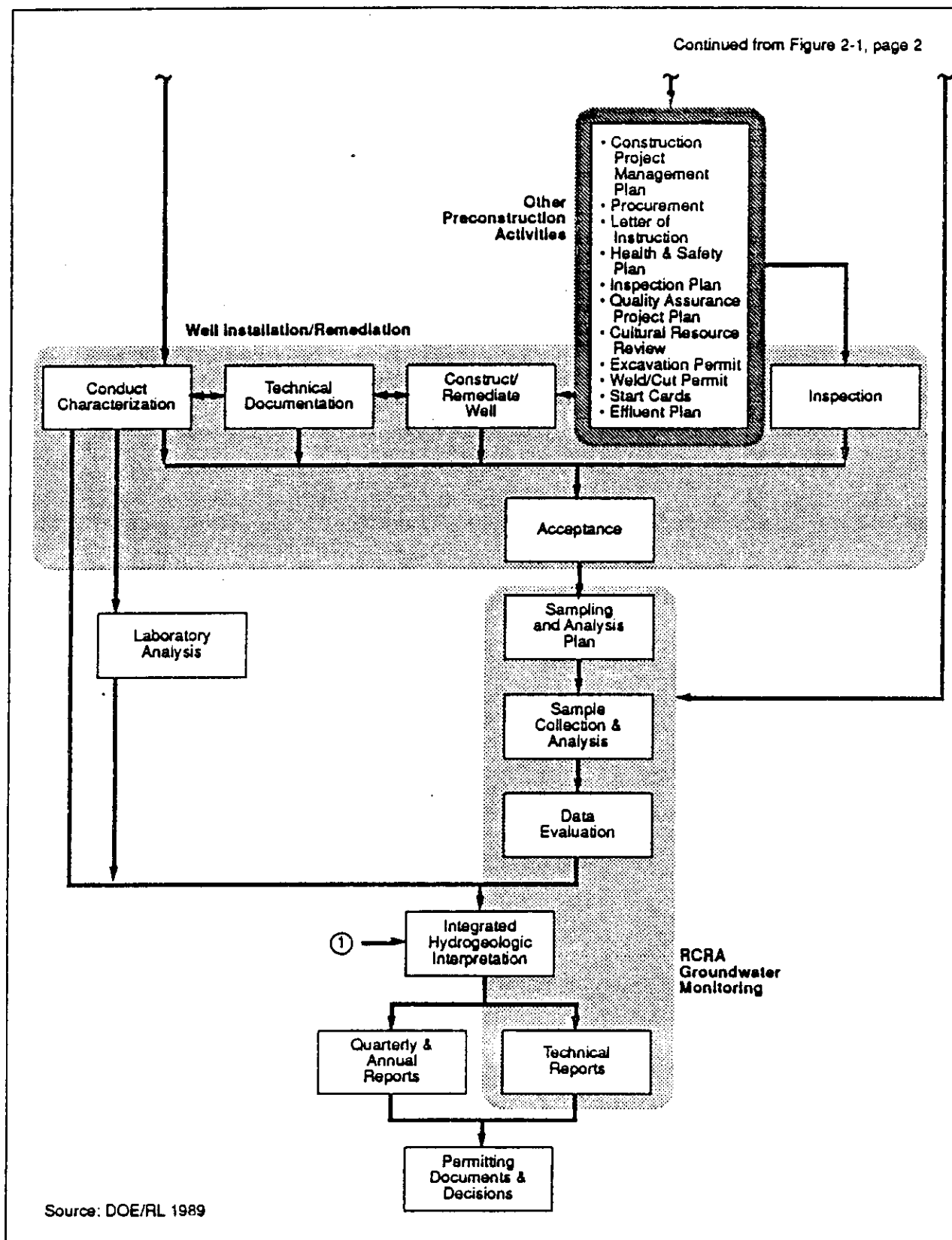


Figure 2-1. Hanford Site RCRA Groundwater Program Process Flow Sheet (page 3 of 3).

3.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

3.1 ORGANIZATION

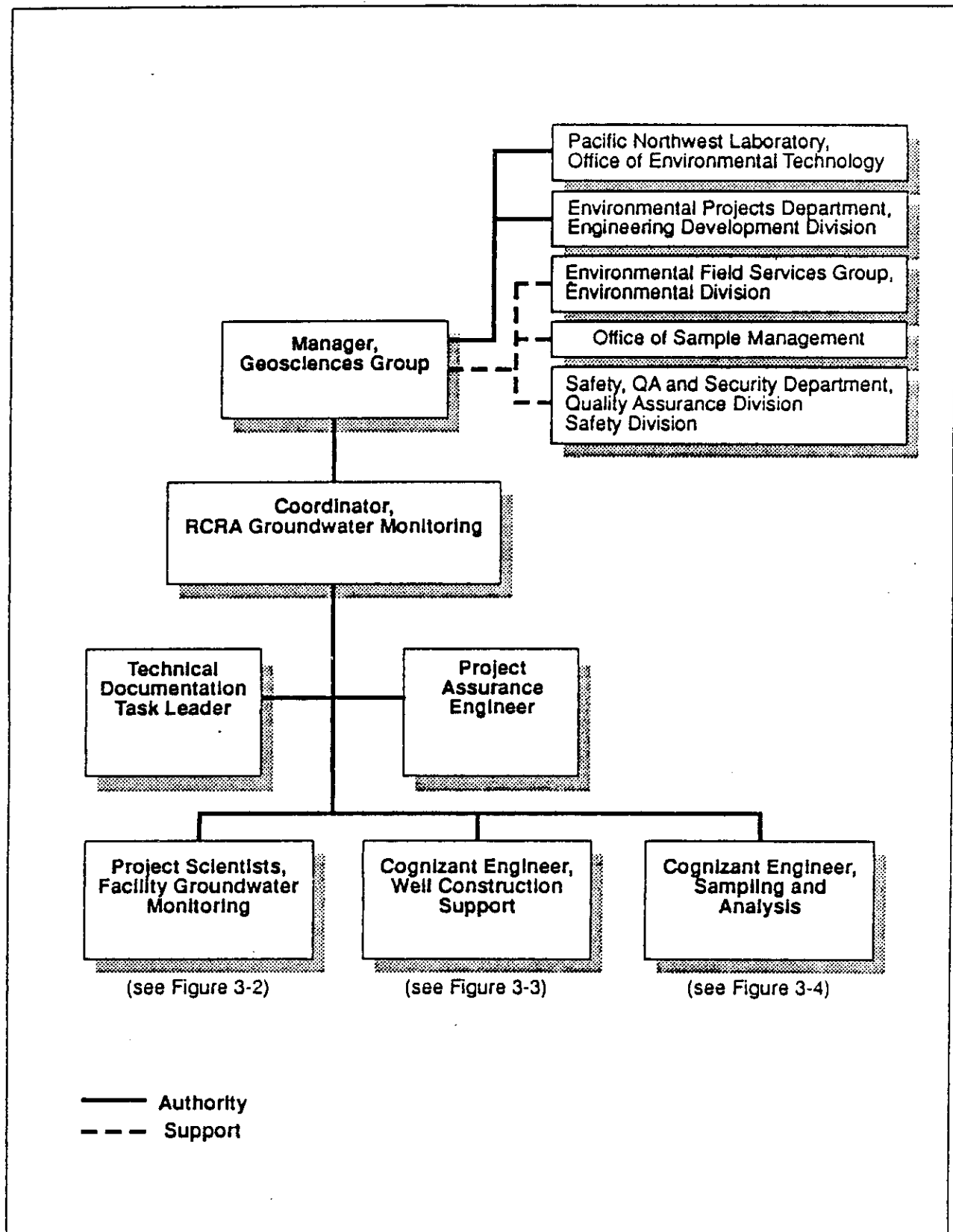
The line organization of the RCRA Groundwater Monitoring Program is shown in Figure 3-1. This and other organization charts in this PMP have been designed to emphasize the titles of individuals with authority to implement the management controls described in this PMP. The interactions of these individuals are described in overview in this section and their detailed responsibilities are described in Section 3.2.

The RCRA Groundwater Monitoring Program is managed by the Geosciences Group, Environmental Engineering and Geotechnology Function of the Environmental Division. Levels of organization above the Geosciences Group are not shown on Figure 3-1 but are explained in WHC-CM-1-2 (WHC 1987b). Management responsibility for the RCRA Groundwater Monitoring Program is vested in the RCRA Groundwater Monitoring Program Coordinator, who reports directly to the Geosciences Group Manager or his designee. Supporting services from other organizations within Westinghouse Hanford or from offsite subcontractors are obtained through the Geosciences Group Manager but are coordinated on a working level within the RCRA Groundwater Monitoring Program. Three organizations within the RCRA Groundwater Monitoring Program report to the Coordinator, and the leaders of those organizations are responsible for the three principal aspects of the program. These organizations are (1) facility groundwater monitoring; (2) well construction support; and (3) sampling and analysis.

3.1.1 Facility Groundwater Monitoring

An organization chart for facility groundwater monitoring is shown in Figure 3-2. This organization consists of a group of project scientists that report directly to the RCRA Groundwater Monitoring Program Coordinator for day-to-day direction within the RCRA Groundwater Monitoring Program. Each project scientist is designated responsibility for one or more of the 21 RCRA facilities identified in the figure. Additional facilities may be added as authorized by the RCRA Groundwater Monitoring Program Coordinator. In overview, the project scientist is responsible for planning, organizing, and maintaining technical review of activities at the facility that affect groundwater monitoring. The project scientist is also the primary technical interface with the facility manager, the Westinghouse Hanford Permitting Function, and regulatory agencies on issues involving RCRA groundwater monitoring.

The first responsibility of the project scientist is generally to characterize the hydrogeology of the facility and prepare groundwater monitoring and sub-tier SAPs. Those plans are prepared with the support of the RCRA Groundwater Monitoring Program well construction support and sampling and analysis organizations, in accordance with Washington State Department of Ecology (Ecology) requirements in WAC 173-303 *Dangerous Waste Regulations* (Ecology 1991). The plans describe the geology and hydrogeology of the facility and identify the principal monitoring requirements.



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Figure 3-1. Organization Chart for RCRA Groundwater Monitoring

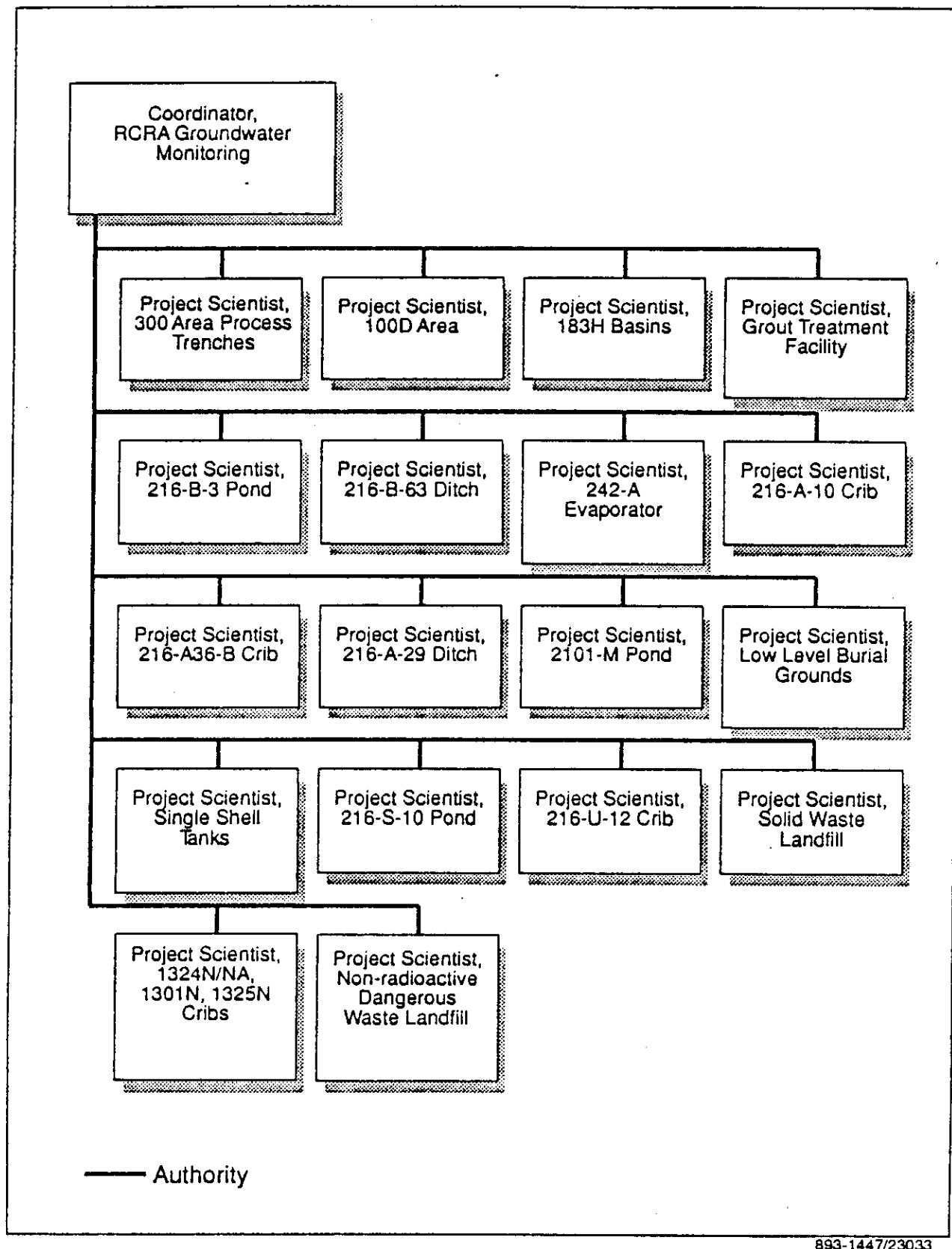


Figure 3-2. Organization Chart for Facility Groundwater Monitoring

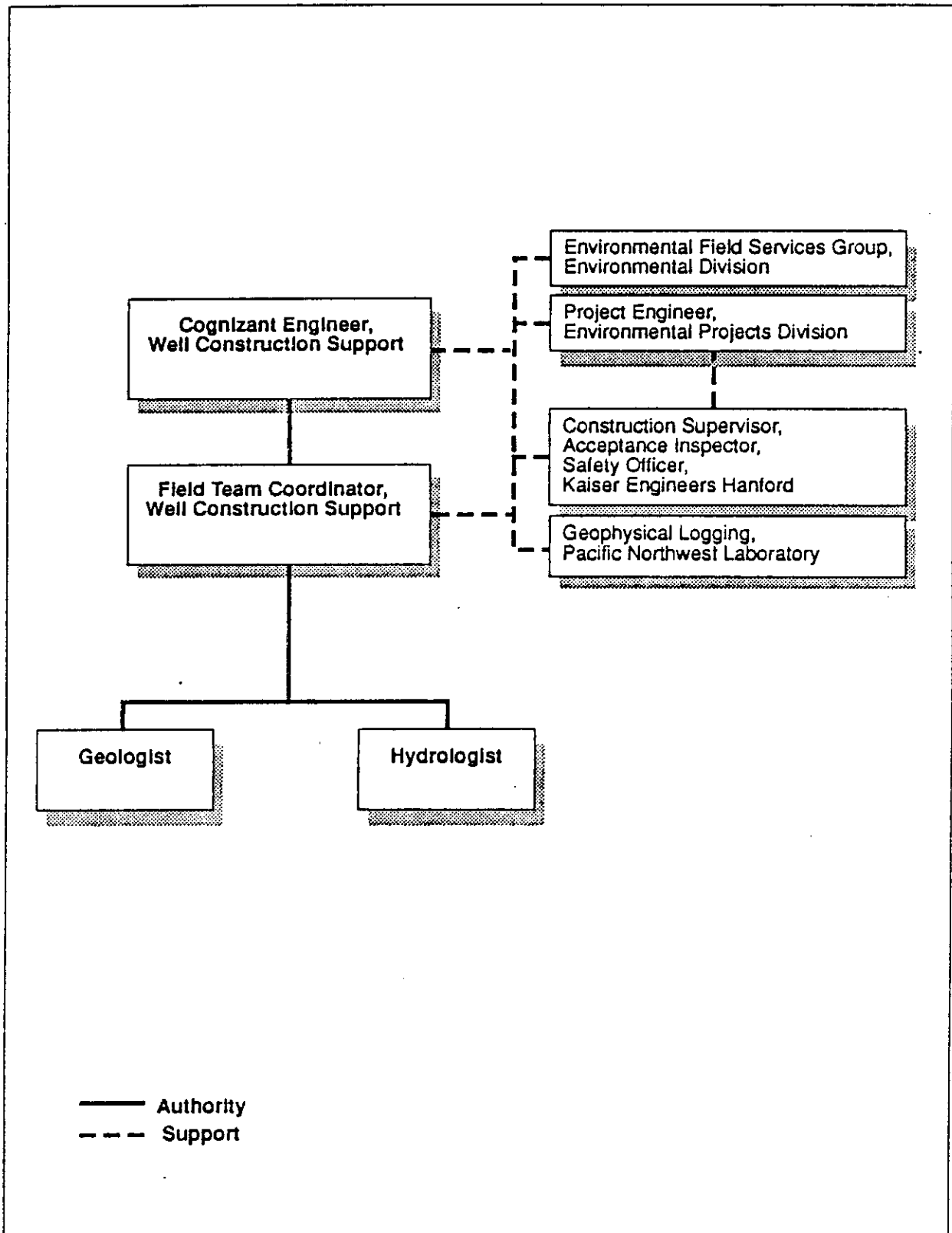
The groundwater monitoring plan generally provides the conceptual basis for monitoring network design and data analysis, and the SAP generally provides detailed instructions for soil and water sampling. The approved plans serve as the basis for definitive design, construction and testing of the monitoring wells, and initiation of groundwater monitoring. The results of the testing and monitoring are provided to the project scientist who evaluates those results with the support of the other RCRA Groundwater Monitoring Program organizations, and prepares the necessary regulatory reports for the facility.

3.1.2 Well Construction Support

An organization chart for well construction support is presented in Figure 3-3. The well construction support organization provides design, geological, and hydrological support during well construction under the direction of the well construction support cognizant engineer. The well construction support cognizant engineer provides functional design criteria, facilitates definitive design, and supports construction of the conceptual monitoring well network design developed by the project scientist. The well construction support cognizant engineer provides formal interface with the Environmental Projects Department. The responsibilities of the project engineer and the well construction support cognizant engineer are described in a Westinghouse Hanford Memorandum of Understanding prepared by the functional managers of the Environmental Projects Department and the Environmental Engineering and Geotechnology Function (Brown and Dronen, 1990).

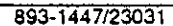
Procurement of drilling services, materials, and supervision of well construction are Kaiser Engineers Hanford (KEH) responsibilities. In addition, KEH provides a site safety officer and an acceptance inspector for the wellsite. Geophysical logging is provided by Pacific Northwest Laboratory (PNL), by subcontractors, or by the Geosciences Group. Special engineering services may be obtained as required from the Environmental Division's Environmental Field Services Group. The well construction support cognizant engineer works with these organizations to facilitate well construction activities and ensures technical requirements identified by the project scientist are met.

The Geosciences Group Manager assigns a field team coordinator to coordinate day-to-day onsite support at each well. The field team coordinator reports to the well construction support cognizant engineer. The field team coordinator is assisted by a geologist during drilling, who collects soil samples and provides a geological log of the hole, and by a hydrologist following drilling, to take predevelopment water samples, to support well completion and development, to perform any required aquifer testing, and to support sampling pump installation and testing. The positions of geologist and hydrologist could be assumed by the same individual. The results of chemical soil and water analyses are entered by the Office of Sample Management (OSM) into the Hanford Environmental Information System (HEIS) database.



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Figure 3-3. Organization Chart for Well Construction Support



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3.1.3 Sampling and Analysis

An organization chart for sampling and analysis is presented in Figure 3-4. This organization coordinates monitoring activities following well completion and acceptance and is under the direction of the sampling and analysis cognizant engineer. The sampling and analysis cognizant engineer facilitates sample collection and chemical analysis, and provides management, evaluation, and quality control services for the groundwater monitoring data.

The activities of this organization have been performed by PNL. The chart presented in Figure 3-4 reflects the organization that is expected to exist following assumption of the data management, data evaluation, and quality control responsibilities by Westinghouse Hanford during FY 1991. As currently planned, the contracting for groundwater sampling, chemical analysis, laboratory data validation, and the coordination of data entry into the HEIS will be assumed by the OSM at a later date. Data validation is a process of determining whether data conform to specified requirements related to such factors as methods of collection, laboratory analysis, and documentation.

The sampling and analysis cognizant engineer supports the project scientist in preparing the SAP, and facilitates implementation of the groundwater sampling and chemical analysis aspects of that plan by OSM. In the interim, until OSM is staffed to assume RCRA monitoring activities, the groundwater sampling, chemical analysis, and part of the data base management activities will continue to be performed by PNL in accordance with the current Westinghouse Hanford Statement of Work directing PNL activities.

The sampling and analysis cognizant engineer is supported by team leaders for data management, data evaluation, and quality control. The data management team leader is responsible for interaction with HEIS and for the internal data management and display requirements of the RCRA Groundwater Monitoring Program.

The data evaluation team leader is responsible for data evaluation and performing the statistical and trend analyses required for regulatory compliance. Data evaluation is a process of determining whether the data are acceptable for their intended use.

The quality control team leader is responsible for ensuring that the data are collected, analyzed and managed within the requirements of the RCRA Groundwater Management Quality Assurance Project Plan (QAPP). The results of the data evaluation and quality control reviews are provided to the project scientist for regulatory reporting.

3.2 RESPONSIBILITIES

The responsibilities of key project personnel are detailed in the following sections. Specific personnel will be assigned to project positions in Letters of Instruction issued by the Geosciences Group Manager and the RCRA Groundwater Monitoring Program Coordinator. These individuals will ensure that the assigned personnel have the skills and training needed to accomplish their responsibilities.

3.2.1 Manager, Geosciences Group

The Geosciences Group Manager retains overall responsibility for all activities within the Geosciences Group. The Geosciences Group Manager may delegate responsibilities to section managers or project sub-tier personnel within the Geosciences Group. Responsibilities of the Geosciences Group Manager include the following:

- Appoints the coordinator for RCRA groundwater monitoring, nominates project cognizant engineers for the approval of the Environmental Engineering and Technology Manager [WHC-CM-6-1 EP-5.2 (WHC 1987a)], assigns a well construction support field team coordinator to coordinate day-to-day onsite support at each well, and approves the appointment of qualified Geosciences Group personnel to RCRA Groundwater Monitoring Program functions
- Coordinates all supporting activities on an administrative level that are required for the RCRA Groundwater Monitoring Program from organizations outside the Geosciences Group, including subcontractors; however, at the manager's discretion, project sub-tier personnel may coordinate directly with supporting personnel from other groups on technical issues
- Acts as the cost account manager for the RCRA Groundwater Monitoring Program, is responsible for cost and schedule, for approving changes to the work breakdown structure that involve costs and schedules, and for interfacing the cost work breakdown structure of the cost account plan with the technical work breakdown structure of this PMP
- Responsible for the RCRA Groundwater Monitoring Program change control for reallocation of budgets or significant changes in milestone dates
- Delegates authority and responsibility for any function to project sub-tier personnel, with the exception of signature authority.

3.2.2 Coordinator, RCRA Groundwater Monitoring

The RCRA Groundwater Monitoring Coordinator has overall responsibility for day-to-day technical activities within the RCRA Groundwater Monitoring Program. Responsibilities of the RCRA Groundwater Monitoring Program Coordinator include the following:

- Nominates all RCRA Groundwater Monitoring Program sub-tier personnel for approval (or renomination) by the Geosciences Group Manager or his designee
- Maintains an awareness of all activities within the RCRA Groundwater Monitoring Program and facilitates cooperative work efforts within the sub-tier organizations and with offsite organizations

- Maintains an awareness of technical, cost, schedule, regulatory, and interfacing issues within the RCRA Groundwater Monitoring Program and brings significant issues to the attention of the Geosciences Group Manager or his designee
- Provides technical guidance to RCRA groundwater monitoring personnel and to offsite organizations
- Reviews RCRA groundwater monitoring activity, staffing, and budget plans
- Reviews RCRA groundwater monitoring performance reports
- Reviews and approves all technical plans, reports, and other technical documents prior to distribution
- Reviews and approves changes to the technical work breakdown structure of this PMP that do not involve schedules or costs
- Prepares topical reports as required
- May delegate authority and responsibility for any function to project sub-tier personnel

The RCRA Groundwater Monitoring Program Coordinator reports directly to the Geosciences Group Manager or his designee. At the RCRA Groundwater Monitoring Coordinator's discretion and with the approval of the Geosciences Group Manager, support for RCRA groundwater monitoring activities may be obtained from subcontractors or other organizations outside the Geosciences Group.

3.2.3 Project Assurance Engineer, RCRA Groundwater Monitoring

The project assurance engineer supports the RCRA Groundwater Monitoring Coordinator by:

- Identifying quality management tools to improve quality
- Observing and/or facilitating customer/supplier relationships
- Developing and/or facilitating creation of tangible quality indicators (measures) for customer/supplier inputs and outputs
- Tracking input/output measures and periodically reporting to the RCRA Groundwater Monitoring Program Coordinator
- Coordinating with the project scientists and cognizant engineers to identify root causes of quality problems and facilitate the implementation of corrective actions
- Interfacing with the Westinghouse Hanford Environmental Division and Projects Construction Quality Assurance, and PNL Process Quality organizations to track and trend deficiency system documents

- Overseeing RCRA groundwater monitoring personnel training
- Coordinating records handling for RCRA groundwater monitoring documents
- Coordinating Environmental Investigations Instruction review for the Geosciences Group.

Primary responsibility for facilitating and monitoring the safety and quality assurance aspects of groundwater sampling and analysis is retained by the quality control team leader in the project Sampling and Analysis Organization. The project assurance engineer reports to the RCRA Groundwater Monitoring Program Coordinator and supports the activities of the sampling and analysis quality control team leader.

3.2.4 Technical Documentation Task Leader, RCRA Groundwater Monitoring

The technical documentation task leader for RCRA groundwater monitoring supports the RCRA Groundwater Monitoring Program Coordinator with technical documentation of activities. Responsibilities of the technical documentation task leader will include the following:

- Coordinates preparation of monthly, quarterly, and annual reports
- Maintains the documentation and reporting files

The technical documentation task leader reports to the RCRA Groundwater Monitoring Program Coordinator.

3.2.5 RCRA Groundwater Monitoring Scientist, Facility Groundwater Monitoring

The RCRA Groundwater Monitoring Program Scientist for Facility Groundwater Monitoring has overall responsibility for RCRA groundwater monitoring activities at one or more assigned RCRA facilities on the Hanford Site. Responsibilities of the RCRA Groundwater Monitoring Program Scientist include the following:

- Plans, organizes, identifies, and maintains technical review of any activities at the facility that affect groundwater monitoring
- Maintains liaison with facility managers
- Interprets and documents geologic and groundwater conditions, and monitoring activities at the facility
- Provides technical information to facility operators regarding groundwater monitoring requirements and operational practices that may affect groundwater quality
- Prepares facility monitoring well network designs

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- Prepares soil sampling and testing requirements for the facility
- Prepares groundwater sampling and testing requirements for the facility
- Prepares aquifer testing requirements for the facility
- Prepares facility groundwater monitoring plans, SAPs, borehole completion data reports, and site characterization reports
- Supports the groundwater monitoring aspects of preparing RCRA Part B permit applications and facility closure plans
- Supports the well construction support cognizant engineer by providing technical oversight to ensure well construction and testing activities are consistent with the groundwater monitoring plan, SAP, QAPP, and supporting documents
- Supports the sampling and analysis cognizant engineer by providing technical oversight to ensure groundwater monitoring and data analysis activities are consistent with the groundwater monitoring plan, SAP, QAPP, and supporting documents
- Provides technical support and prepares required reporting and planning documents for regulatory and permitting issues, including quarterly and annual reports
- Maintains direct technical liaison with subcontractors or other personnel providing technical support
- Interprets the water chemistry, groundwater level, and other data obtained in groundwater monitoring
- Prepares topical reports describing and interpreting the groundwater monitoring activities
- Identifies well remediation and maintenance requirements
- Monitors RCRA Groundwater Monitoring Program technical activities, prepares weekly project status reports of technical issues, and informs the RCRA Groundwater Monitoring Program Coordinator of any significant technical issues
- Monitors RCRA Groundwater Monitoring Program schedule, prepares monthly reports, and informs the RCRA Groundwater Monitoring Program Coordinator of any significant changes in activities that may affect schedules or costs
- Delegates authority with the approval of the RCRA Groundwater Monitoring Program Coordinator, and the section manager.

The RCRA Groundwater Monitoring Program Scientist reports to the RCRA Groundwater Monitoring Program Coordinator.

3.2.6 Cognizant Engineer, Well Construction Support

The well construction support cognizant engineer facilitates definitive design and supports construction of the conceptual monitoring well network design prepared by the RCRA Groundwater Monitoring Program Scientist. Responsibilities of the well construction support cognizant engineer include the following:

- Provides and manages geologic, hydrologic and sampling support during construction and testing of RCRA groundwater monitoring wells
- Prepares and revises functional design criteria for groundwater monitoring wells, and ensures that required safety and environmental protection requirements are defined
- Prepares engineering studies as required to support functional design criteria and conceptual design
- Prepares and revises well construction specifications and approves Engineering Change Notices
- Coordinates and provides technical oversight of subcontractors and other organizations providing well design, drilling, sampling and analysis, testing, and geophysical logging services for those activities that may ultimately affect the ability of the well to provide groundwater samples that meet the requirements of RCRA groundwater monitoring
- Approves nonconformance reports relevant to the technical adequacy of the groundwater monitoring well
- Ensures proper implementation and documentation of the requirements for well construction and testing specified by the groundwater monitoring plan, SAP, functional design criteria, QAPP, and supporting procedures
- Maintains an awareness of all activities within the well construction support organization and facilitates cooperative work efforts with other RCRA groundwater monitoring organizations and offsite organizations
- Provides technical support and guidance to sub-tier personnel and offsite organizations
- Reviews and approves all well construction support technical plans, reports, and other documents
- Transfers geological, hydrological, and chemical data obtained during well construction to the data management sampling and analysis team leader for controlled storage and retrieval
- Provides technical support for regulatory and permitting issues

- Arranges for specialized engineering support from the Environmental Field Services Group, subcontractors, and the sampling and analysis cognizant engineer, with the approval of the RCRA Groundwater Monitoring Program Coordinator and Geosciences Group Manager
- Maintains direct technical liaison with subcontractors or other organizations providing technical support
- Participates in final acceptance inspection of the monitoring wells
- Provides information to the RCRA Groundwater Monitoring Program Scientist regarding any changes required in the groundwater monitoring plan, SAP, or other RCRA groundwater monitoring documents or applicable procedures that result from final monitoring well as-built specifications
- Monitors technical activities, prepares weekly project status reports of technical issues, and informs the RCRA Groundwater Monitoring Program Coordinator of any significant technical issues
- Monitors schedules and costs, prepares monthly schedule reports, and informs the RCRA Groundwater Monitoring Program Coordinator of any significant changes in activities that may affect schedules or costs
- Delegates authority for any function to project sub-tier personnel, with the approval of the RCRA Groundwater Monitoring Program Coordinator and the section manager.

The well construction support cognizant engineer reports to the RCRA Groundwater Monitoring Program Coordinator.

3.2.7 Field Team Coordinator, Well Construction Support

The well construction support field team coordinator provides day-to-day coordination of wellsite support activities. Responsibilities of the well construction support field team coordinator include the following:

- Directs the activities of the geologist and hydrologist
- Provides technical guidance to sub-tier personnel and to external organizations
- Provides technical direction to drill site personnel regarding those activities that may affect the ability of the well to provide groundwater samples that meet the requirements of RCRA groundwater monitoring
- Assists the project engineer on a daily basis
- Coordinates the day-to-day activities of external organizations that support RCRA groundwater monitoring activities

- Ensures that monitoring wells are designed and constructed in compliance with groundwater monitoring plans, well specifications, and applicable operating procedures
- Responsible for the technical accuracy, day-to-day scheduling, and documentation of all Geosciences Group support activities during well drilling and testing
- Assists in review of field logging and testing records
- Assists in staking of well locations
- Ensures that wellsite equipment is inventoried and distributed to the wellsite geologist and hydrologist on a timely basis
- Ensures sampling activities are properly coordinated with the OSM and/or PNL, and that samples are shipped promptly and with proper documentation
- Informs the well construction support cognizant engineer and the RCRA Groundwater Monitoring Program Coordinator of any field problems.

The well construction support field team coordinator reports to the well construction support cognizant engineer.

3.2.8 Geologist

The geologist provides day-to-day wellsite support during drilling. Responsibilities of the geologist include the following:

- Collects, documents, and prepares soil samples for shipment, meeting the requirements presented in the groundwater monitoring plan, SAP, QAPP, and supporting procedures
- Coordinates groundwater sampling during drilling with PNL or OSM, following the requirements presented in the SAP and QAPP.
- Performs and documents field tests on soil, water, and other samples following the requirements presented in the SAP and QAPP.
- Maintains a field log documenting well construction and testing activities and identifying any activities that may ultimately affect the ability of the well to provide groundwater samples that meet the requirements of RCRA groundwater monitoring
- Prepares borehole geologic logs
- Assists in preparing borehole completion reports.

The geologist also may act as the hydrologist.

3.2.9 Hydrologist

The hydrologist provides day-to-day wellsite supporting during well completion, development, and testing. Responsibilities of the hydrologist include the following:

- Provides technical oversight and documents the installation of permanent well equipment and pumps, and directs the driller's activities during well development to ensure the requirements are met in the groundwater monitoring plan, SAP, QAPP, and supporting procedures
- Prepares aquifer test plans based upon the requirements set forth in the groundwater monitoring plan and the SAP
- Performs and documents any required aquifer tests and coordinates the activities of test support service organizations
- Coordinates groundwater sampling during well completion, development, or testing with PNL or OSM following the requirements presented in the SAP and QAPP
- Assists in preparing borehole completion reports.

3.2.10 Project Cognizant Engineer, Sampling and Analysis

The sampling and analysis cognizant engineer directs groundwater sampling and analysis activities following completion, development, testing and acceptance of the monitoring well. Responsibilities of the sampling and analysis cognizant engineer include the following:

- Prepares statements of work to PNL or other subcontractors for sampling and analysis activities
- Coordinates sample preparation, sample collection, laboratory analysis, and laboratory data reporting with PNL or OSM
- Provides ongoing quality assurance review and technical evaluation of the services provided by PNL or OSM
- Provides and manages data management, data evaluation, and quality control support for groundwater sampling and analysis
- Coordinates the activities of subcontractors or other organizations providing technical support services for sampling and analysis
- Maintains an awareness of all activities within the sampling and analysis organization and facilitates cooperative work efforts with other RCRA groundwater monitoring organizations and offsite organizations
- Provides technical and administrative support and guidance to sub-tier personnel and to offsite organizations

- Reviews and approves all sampling and analysis technical plans, reports, and other documents
- Interprets and documents data obtained during groundwater monitoring
- Ensures controlled storage and retrieval for groundwater monitoring data used in support of regulatory and permitting documents
- Provides technical support for regulatory and permitting issues
- Provides data and results to the RCRA Groundwater Monitoring Program Scientist for interpretation and regulatory reporting
- Maintains direct technical liaison with subcontractors or other organizations providing technical support
- Monitors technical activities, prepares weekly project status reports of technical issues, and informs the RCRA Groundwater Monitoring Program Coordinator of any significant technical issues
- Monitors schedules and costs; prepares monthly schedule reports, and informs the RCRA Groundwater Monitoring Program Coordinator of any significant cost and schedule changes
- May delegate authority and responsibility for any function to project sub-tier personnel, with the approval of the RCRA Groundwater Monitoring Program Coordinator and section manager.

The sampling and analysis cognizant engineer reports to the RCRA Groundwater Monitoring Program Coordinator.

3.2.11 Data Management Team Leader

The data management team leader provides data management support to the sampling and analysis cognizant engineer and to the other sampling and analysis team leaders. Responsibilities of the data management team leader include the following:

- Provides storage and retrieval interface for project data with the HEIS
- Provides data formatting and display support, and project-specific data management services
- Provides HEIS field database management
- Provides management and technical direction to supporting data clerks and other personnel
- Provides supporting data base management services to other sampling and analysis team leaders.

The data management team leader reports to the sampling and analysis cognizant engineer.

3.2.12 Data Evaluation Team Leader

The data evaluation team leader provides data evaluation support to the sampling and analysis cognizant engineer and to the other sampling and analysis team leaders. Responsibilities of the data evaluation team leader include the following:

- Reviews and evaluates the groundwater monitoring data
- Implements the statistical analyses described in the groundwater monitoring plan and SAP and provides the results to the RCRA Groundwater Monitoring Program Scientist
- Provides management and technical direction to support statisticians, geochemists, and other personnel.

The data evaluation team leader reports to the sampling and analysis cognizant engineer.

3.2.13 Quality Control Team Leader

The quality control team leader supports the sampling and analysis cognizant engineer and other sampling and analysis team leaders. Responsibilities of the quality control team leader include the following:

- Provides ongoing review of the quality of groundwater monitoring data obtained from analytical laboratory and field tests, to ensure that the data quality objectives and standards established are met in the groundwater monitoring plan, SAP, and QAPP
- Provides quality assurance overview of the analytical laboratory and field sampling support practices and procedures
- Coordinates activities with the project assurance engineer for RCRA Groundwater Monitoring
- Supports external quality assurance audits of sampling and analysis activities
- Provides management and technical direction to supporting quality control engineers
- May delegate authority and responsibility for any function to project sub-tier personnel.

The quality control team leader reports to the sampling and analysis cognizant engineer.

4.0 PROJECT MANAGEMENT AND CONTROL

4.1 WORK BREAKDOWN STRUCTURE

The work breakdown structure for RCRA groundwater monitoring is presented in Figure 4-1 and on Tables 4-1 through 4-4. This work breakdown structure is designed to provide a systematic approach to technical activity planning, management and control, but may not conform to the work breakdown structure in the current Geosciences Group cost account plan. The Geosciences Group Manager is responsible for interfacing between the two systems. All anticipated work activities have been assigned a unique numerical designation that is intended to provide a comprehensive and flexible level of activity breakdown. For purpose of planning, controlling, and monitoring individual activities, additional sub-tier levels of work breakdown detail may be added with the approval of the of the RCRA Groundwater Monitoring Program Coordinator.

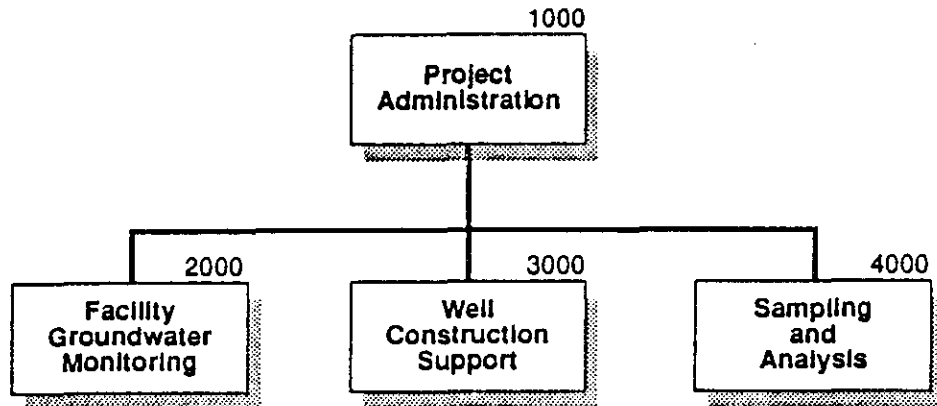
4.2 COST AND SCHEDULE CONTROL

The Geosciences Group Manager or his designee is the cost account manager for all Geosciences Group activities. The Westinghouse Hanford Management Control System (WHC 1988b) will be used for cost and schedule control. This system meets the requirements of DOE Order 4700.1, *Project Management System* (DOE 1987), and DOE Order 2250.1B, *Cost and Schedule Control Systems Criteria for Contract Performance Measurement* (DOE 1985). The primary goals of the Westinghouse Hanford Management Control System are to provide methods for planning, authorizing, and controlling work so that it can be completed on schedule and within budget, and to ensure that all planning and work performance activities are technically sound and in conformance with management and quality requirements.

Costs and schedules are projected and tracked by the Geosciences Group Manager or his designee. The work breakdown structure will be used as a guideline for budget planning and a control tool for allocating budgets appropriate for the activity. Decision factors will include the dollar value, duration of the activity, and the cost sensitivity of the activity. Projected costs and schedules are documented in the cost account plan.

Costs and schedules are projected based upon work scope, historical costs and schedules, escalation factors, and professional judgement. Projections are provided to the Geosciences Group Manager through the RCRA Groundwater Monitoring Program Coordinator.

Performance is tracked by identifying the status of work in progress, and comparing planned costs and schedules with the actual work accomplished. A detailed description of the method is presented in the management control system. Actual and accrued costs are normally provided by Westinghouse Hanford to the Geosciences Group Manager on a monthly basis in a task package status report. Current cost and schedule information is prepared with the assistance of the RCRA Groundwater Monitoring Program Coordinator, RCRA Groundwater Monitoring Program Scientist, and cognizant engineers.



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Figure 4-1. Work Breakdown Structure Overview

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Table 4-1. Work Breakdown Structure for Project Coordination.

1100	Project Management
1100	Technical Coordination
1120	Staffing and Budget Planning and Scheduling
1130	Project Interface Support
1140	Regulatory Support
1150	Quality Assurance and Health and Safety Support
1160	Documentation and Reporting
1200	Technical Management
1210	Facility Groundwater Monitoring
1220	Well Construction Support
1230	Sampling and Analysis

This information is then reviewed and forwarded by the cost account manager to the Environmental Waste Management/Environmental Waste Program office for analysis. Performance is tracked on a monthly basis, but more frequent tracking may be requested by the cost account manager.

4.3 CHANGE CONTROL

Changes impacting the scope, schedule, or cost of an activity will be documented by the Geosciences Group Manager, who is the cost account manager for all Geosciences Group activities. The cost account manager may directly approve minor changes of milestones or budgets that occur within a specified cost account plan, that do not involve additional costs, and that do not modify an existing contractual or procurement document. Other types of changes may require approval by the Environmental Monitoring Program Office, Westinghouse Hanford Procurement, Westinghouse Hanford Change Evaluation Board, or DOE/RL, and requests for such changes will be forwarded to the appropriate organization, at the discretion of the cost account manager.

4.4 PROJECT REPORTS AND MEETINGS

Regularly-scheduled project reports and meetings are used to control the technical, cost and schedule of RCRA groundwater monitoring activities, and to provide a forum for reviewing any problems that may occur. The principal reports and meetings are listed below; additional reports and meetings may be requested by the Geosciences Group Manager, the RCRA Groundwater Monitoring Program Coordinator, or by sub-tier managers as required to address specific issues.

Table 4-2. Work Breakdown Structure for Facility Groundwater Monitoring.

2100	Project Management
2110	Technical Coordination
2120	Staffing and Budget Planning and Scheduling
2130	Project Interface Support
2140	Regulatory Support
2150	Quality Assurance and Health and Safety Support
2160	Procurement
2200	Technical Management
2210	Geologic Characterization
2211	Stratigraphy
2212	Structure
2213	Soil Contamination
2214	Well Logging Requirements
2220	Hydrogeologic Characterization
2221	Conceptual Groundwater Models
2222	Numerical Groundwater Models
2223	Groundwater Use
2224	Groundwater Quality
2230	Sources of Contamination
2240	Monitoring Well Network
2241	Well Construction Requirements
2242	Well Locations and Depths
2250	Soil Sampling and Testing Requirements
2251	Sampling Methods, Locations and Frequencies
2252	Chemical Analytes and Methods
2253	Statistical Data Analysis Design
2260	Groundwater Sampling and Testing Requirements
2261	Sampling Methods, Locations and Frequencies
2262	Chemical Analytes and Methods
2263	Statistical Data Analysis Design
2270	Aquifer Test Requirements
2271	Testing Objectives, Methods and Locations
2272	Data Analysis Methods
2280	Well Remediation and Maintenance Requirements
2300	Documentation and Reporting
2310	Documentation
2311	Groundwater Monitoring Plans
2312	Sampling and Analysis Plans
2313	Closure plans
2314	Site Characterization Reports
2315	Borehole Completion Data Reports
2320	Reporting
2321	Weekly and Monthly Management Reports
2322	Quarterly and Annual Regulatory Reports
2330	Data Management

Table 4-3. Work Breakdown Structure for Well Construction Support.

3100	Project Management
3110	Technical Coordination
3120	Staffing and Budget Planning and Scheduling
3130	Project Interface Support
3140	Regulatory Support
3150	Quality Assurance and Health and Safety Support
3160	Procurement
3170	Drilling and Geophysical Support Coordination
3200	Geologic Support
3210	Geologic Support Coordination
3220	Soil Sample Collection
3230	Physician Soil Analysis Coordination
3240	Chemical Soil Analysis Coordination
3300	Borehole Geophysical Logging
3310	Borehole Geophysical Logging Support
3320	Borehole Geophysical Logging
3330	Spectral Gamma Logging
3400	Hydrologic Support
3410	Hydrologic Support Coordination
3420	Purge Water/Pre-Development Sampling and Analysis Coordination
3430	Well Completion and Development
3440	Aquifer Testing
3450	Aquifer Testing Analysis
3500	Documentation
3510	Aquifer Test Plans
3520	Hydrologic Testing Reports
3530	Data Management
3540	Field Documentation

Table 4-4. Work Breakdown Structure for Sampling and Analysis (sheet 1 of 2).

4100	Project Management
4110	Technical Coordination
4120	Staffing and Budget Planning and Scheduling
4130	Project Interface Support
4140	Regulatory Support
4150	Quality Assurance and Health and Safety Support
4160	Procurement
4170	Sample Collection and Analysis Coordination
4200	Sample Preparation (by PNL or OSM)
4210	Sample Containers and Collection Kits
4220	Materials Procurement
4230	QA Documentation
4300	Sample Collection (by PNL or OSM)
4310	Field Operations
4320	Field Vehicles and Equipment Maintenance
4330	Purge Water Disposal
4340	Radiological Monitoring
4350	QA Documentation
4400	Laboratory Analysis (by PNL or OSM)
4410	Laboratory Procurement and Coordination
4420	Laboratory Performance Oversight
4430	Sample Packaging and Shipping
4440	QA Documentation
4500	Laboratory Data Reporting (by PNL or OSM)
4510	Laboratory Data Validation
4520	HEIS Laboratory Database Management
4600	Data Management
4610	Data Storage and Retrieval
4620	Data Formatting and Display
4630	Field Data Validation
4640	HEIS Field Database Management
4650	HEIS Database Interface
4700	Data Evaluation
4710	Data Evaluation
4720	Statistical Data Analysis

Table 4-4. Work Breakdown Structure for Sampling and Analysis (sheet 2 of 2).

4800	Quality Control
4810	Conformance with Plan, Procedure and Procurement Requirements
4820	Conformance with Regulatory Requirements
4830	Internal Audits
4840	External Audit Support
4900	Documentation
4910	Database Documentation
4920	QA Documentation
4930	Sampling and Analysis Reports

RCRA Groundwater Monitoring Project Meetings. Project personnel attend meetings chaired by the RCRA Groundwater Monitoring Program Coordinator to discuss plans and progress, and to identify problems. Significant problems and scope changes are documented in meeting memoranda.

Well Construction Status Meetings. Well construction support personnel attend weekly meetings (during drilling) chaired by the well construction support cognizant engineer to discuss plans and progress, and to identify problems. Significant problems and scope changes are documented in meeting memoranda.

Management Reports. Weekly reports to the Geosciences Group Manager, prepared by the RCRA Groundwater Monitoring Program Coordinator, to detail groundwater monitoring status.

Performance Reports. Monthly performance reports are prepared by the Geosciences Group Manager or his designee to provide cost and schedule control information.

Quarterly Regulatory Reports. Reports to DOE/RL prepared by the RCRA Groundwater Monitoring Program Scientist, providing water level and sampling data.

Annual Regulatory Reports. Reports to DOE/RL, prepared by the RCRA Groundwater Monitoring Program Scientist, summarizing and interpreting water level and sampling data collecting during the year, identifying the rate and direction of groundwater movement at the RCRA facilities, summarizing all pertinent activities at the facilities and identifying any problems, and evaluating the extent of groundwater contamination (if compliance assessment monitoring is being conducted).

4.5 QUALITY ASSURANCE

The quality assurance requirements for this project are identified in the QAPP (WHC 1990a) and the QAPP for RCRA Groundwater Monitoring Activities (WHC 1990b). The RCRA Groundwater Monitoring QAPP presents detailed lists of chemical analytes and technical procedures that may be used to implement RCRA groundwater monitoring at a specific facility. All activities by Geosciences Group personnel will be performed in accordance with that QAPP. Supporting activities by subcontractors or organizations outside the Geosciences Group (i.e., drilling, logging, sampling, and laboratory analysis) will be controlled by the quality assurance requirements of that organization, or as specified in contractual or procurement documents.

5.0 REFERENCES

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